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Utility Patent Application

For

5 Method and Apparatus for Forming a Multiple Bundle

Hinged Lid Hinged Cigarette Pack

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BACKGROUND OF THE INVENTION

The present invention is directed towards a cigarette wrapping machine which forms a hinged lid, hinged side by side carton or pack of cigarettes wherein a first foil wrapped bundle is placed in hinged side by side relationship with a second foil wrapped bundle.

SUMMARY OF INVENTION

The system of the present invention provides for a cigarette packing machine, the machine consisting of three separate machines, a first cigarette wrapping machine, a second cigarette wrapping machine and a third cigarette combining machine. The system of the present invention provides for creation of a first and a second foil wrapped inner frame bundle for combining at a subsequent machine which partially surrounds them with an outer frame having a hinged lid. The outer frame member also provides for a side hinge and a separated bottom wall

such that each of the individual foil wrap bundles may be hinged along a given adjoining side.

The three machine cigarette packers of the present invention utilizes a first and a second cigarette packer which have similar designs. Each of the first and second cigarette packers or 5 cigarette wrapping machine may be modified according to the desired combination of cigarettes to be eventually wrapped in the hinged lid pack, but in the present design the first and the second cigarette pack are utilized to form a thirteen cigarette bundle and a seven cigarette bundle. The first and the second cigarette packer are of similar design such that initially cigarettes are fed into the packer at an in-feed station. The cigarettes at the in-feed station are then lined up and placed 10 on a cigarette conveyor to be combined as necessary and thereafter fed into the foil wrapping station. The foil wrapping station utilizes foil drawn from a bobbin such that the foil wraps the requisite cigarette bundle as necessary and also applies the necessary perforations along an upper section thereof as is standard practice. Due to the perforations placed in the upper portions of the foil, the upper section of the foil wrap may be removed by the consumer upon initial opening of 15 the cigarette pack. In both the first and the second cigarette packing machine, the foil wrapped bundle is then conveyed to an individual station in a blank conveyor. Prior to insertion of the foil wrapped cigarette bundle into the blank conveyor station, the side walls of the individual cigarette blank are upturned by the appropriate folding mechanism. Additionally, a small dot or placement of adhesive may be utilized to affix the foil wrap cigarette bundle onto the flat face of 20 the cigarette blank. The blank conveyor then conveys the rejoined foil wrapped cigarette bundle and inner carton to the appropriate folding stations. A second spot of adhesive may be placed on

the opposing flat planar surface so that the foil wrapped bundle is securely affixed to both the front and back surface of the inner frame carton.

The combined inner frame carton and foil wrapped cigarette bundle is folded

5 appropriately on all sides and adhesive is applied where necessary to assure that the folding flaps maintained their position. The side member folding operation may then take place prior to insertion of the combined inner frame carton and foil wrapped bundle into the heated drying drum.

10 A third cigarette packing machine is provided which receives the foil wrapped bundles having an inner frame and places an outer frame around the combined face to face positioned foil wrapped bundles to make a hinged lid pack having a vertical side hinge. The bottom panel of the outer frame is cut to allow opening along the hinge line. The pack has a hinged lid and the individual foil wrapped bundles are separable by virtue of the hinge. The third packing machine
15 applies a long hinge panel or flap which is adhesively applied to a side wall of one of the foil wrapped bundles. The hinge panel also has a score or hinge line to allow the individual foil wrapped bundles to hinge.

BRIEF DESCRIPTION OF THE DRAWINGS

20 This invention may be more clearly understood with the following detailed description and by reference to the respective drawings in which:

Figure 1 is a perspective view of the hinged side by side pack of the present invention;

Figure 2 is a perspective partial cut away view of the first foil wrapped bundle formed by the cigarette wrapping machine of the present invention;

Figure 3 is a perspective partial cut away view of the second foil wrapped bundle formed
5 by the cigarette wrapping machine of the present invention;

Figure 4 is a plan view of the outer frame blank used by the cigarette wrapping machine of the present invention;

Figure 5 is a plan view of one of the inner frame members used by the cigarette wrapping machine of the present invention for creating one of the foil wrapped bundles;

10 Figure 6 is a plan view of the one of the inner frame members used by the cigarette wrapping machine of the present invention for creating one of the foil wrapped bundles;

Figure 7 is a top plan layout view of the cigarette wrapping machines which are part of the invention;

Figure 8 is a schematic view of the foil wrap bundle paths used in the present invention;

15 Figure 9 is a top perspective view of the cigarette wrapping machines of the present invention for creation of the separate foil inner frame wrapped bundles;

Figure 10 is a perspective view of the inverting station for one of the exit conveyors of the present invention;

20 Figure 11 is a perspective view of the combination station of the present invention for combining the separate foil wrapped bundles into a single bundle;

Figure 12 is a perspective view of the cigarette wrapping machine used for creation of the

outer frame in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 Shown in Figure 1 is the hinged lid side by side hinged pack 10 of the present invention. The machinery which creates the hinged lid side-by-side hinged cigarette pack 10 is comprised of three different machines, Hinged Lid Packer (HLP1) or first cigarette wrapping machine 30, HLP2 or second cigarette packing machine 31 and HLP3 or third cigarette packing machine 32, shown in Figure 7. Both of HLP1 30 and HLP2 31 are designed to create individual foil wrapped 10 cigarette bundles which are wrapped in inner frames and then wrapped in an outer frame in the HLP3 32 machine.

 HLP2 31 can be utilized, as is set forth herein, to make a thirteen cigarette bundle 14, shown in Figure 1 and 3. HLP2 31 creates the thirteen cigarette bundle 14 by first placing six 15 and seven stacked cigarette rows together on a cigarette alignment conveyor 53, shown in Figure 9, wrapping the stacked cigarettes with foil 54 and then surrounding the foil with an inner frame 23 for an exemplary thirteen cigarette bundle 14.

 Similarly, HLP1 30 can be utilized to form a single row of seven cigarettes, wrap these 20 cigarettes in foil lining 16, place this seven cigarette bundle onto the blank conveyor which are then partially surrounded by the inner frame 23 for the seven cigarette bundle 12.

Both of the inner frame wrapped cardboard bundles 12, 14 are axially aligned as inner frame cartons and are then wrapped in an outer frame 26 in HLP3 32. Thus, after manufacturing of both the thirteen's cigarette bundle and the seven's cigarette bundle packs, both bundles are 5 forwarded to HLP3 32 and are combined with the outer frame or outer carton member 26 which is folded around the two foil wrapped bundles 12, 14, glued at the proper seams, and then cut along the bottom panel 27 so that it may open along the vertical hinge line 16 at the side.

In operation, both HLP1 30 and HLP2 31 work very similarly for creation of the first 10 and a second foil wrapped cigarette bundle 14, 16. Thus, explanation for the cigarette wrapping machines herein applies to each machine. Referring to Figure 9, cigarettes are fed to the cigarette wrapping machine 50 through a cigarette intake chute 52. The cigarettes are aligned by the alignment conveyor 53 to prepare the cigarettes for individual bundle formation. Foil wrap 54 is fed from a spool or bobbin for wrapping of the cigarette bundle in a foil wrap station 55. The 15 cigarette bundle may be formed in either a 7 or 13 bundle as previously indicated in the present pack design but many other alternative constructions and cigarette counts are readily available for use in the present hinged lid pack design.

The cigarette bundle is forwarded by the cigarette alignment conveyor 53 to the foil 20 wrapping station 55 where foil 54 is unrolled off of a foil roll suspended from above such that the cigarette bundle is wrapped appropriately in foil. The foil wrapped bundle 55a is then forwarded to the inner frame blank conveyor 56. In the blank conveyor 56 are located individual stations

which receive cigarette carton blanks 58 from the inner frame blank chute 57. Prior to a foil wrap bundle 55a being inserted into the individual station on the blank conveyor 56 having a blank inserted therein, a small dot of adhesive may be applied to a front flat planar surface so that the cigarette bundle 55a remains stationary thereon. After placement of the foil bundle 55a into 5 the individual blank 58 in the blank conveyor 56 , the folding operations begin for folding of the inner frame blank 58 around the foil bundle 55a. A second dot of adhesive may be placed on the opposing flat surface of the inner frame blank 58 to secure the foil wrapped bundle 55a within the inner frame 58. After placement of the second adhesive dot on the interior wall of the inner frame, the inner frame 58 is folded around the foil wrapped bundle 55a in the folding and 10 adhesive application stations 59 and the formed inner frame foil wrapped cigarette bundle is passed through an inspection station where improperly folded inner frame members are rejected. After the inspection station, the individual packs are passed by the conveyor which moves the foil wrapped bundle from the individual stations of the blank conveyor 56 to a drum application of adhesive so that an adhesive is applied to the long side seams for the folding operation of the 15 sides or seams. After the long sides are folded, the now formed inner frame with the foil lined cigarette bundle (12, 14) located therein is passed into the drying drum 61 by the plunger 60 which allows the long side seam adhesive to dry before the pack is removed from the drum 61 and passed to an exit conveyor 65 through an exit aperture 63 formed in the drum 61. Thus, subsequent to the drying drum 61, the fully formed inner frame cigarette bundles, 12 and 14 20 depicted in Figures 2 and 3, are positioned properly and ready for advancement to cigarette wrapping machine HLP3 32 for creation of the outer frame and hinged lid of the pack.

In both the first cigarette wrapping machine 30 and second cigarette wrapping machine 31, HLP1 and HLP2, the system generally utilizes the same process for formation of the individual cigarette foil wrapped bundles, namely the seven cigarette bundle and the thirteen 5 cigarette bundle. The cigarettes are funneled into the wrapping machine and the inner frame is wrapped or formed there around. Each of the inner frame surrounded foil wrapped bundles 12 and 14, as shown in Figures 2 and 3, are formed with the respective inner frame blanks 22 and 23 shown in Figure 5 and 6. In Figure 5, the thirteen's inner frame 22 is shown wherein an inner face member 22a, bottom wall 22b and outer face 22c is shown and is formed in the second 10 cigarette wrapping machine 31 (HLP2). Further, a cutout 22d is also formed in the inner frame blank. As can be seen in the fully formed thirteen's pack 14 of Figure 3, the inner frame 22 covers almost the entirety of the foil wrapped bundle of cigarettes. The cutout section 22d is formed such that the foil can be grasped from the outside wall of the pack 10 without the two individual bundles, 14 and 12, being separated about vertical hinge line 16b, shown in Figure 1.

15 Likewise, the seven's cigarette bundle or pack 12, shown in Figure 2, is formed in the first cigarette wrapping machine 30 (HLP1). The inner frame 23 is shown in Figure 6 wherein the inner frame 23 for the bundle pack 12 is formed of an inner face 23a, bottom wall 23b and an outer face 23c. Sidewall 23d is also shown and is constructed so as to adhesively receive the hinge panel 16c of the outer frame 26, shown in Figure 4. Thus, after the two foil wrapped 20 bundles are formed, 12 and 14, they are placed in front to front abutting relationship and then wrapped in the third cigarette wrapping machine 32 by the outer frame 26, shown in Figure 4.

The outer frame 26 manipulated by the third cigarette wrapping machine 32 has a cover 29, hinged lid section 16, score or cut line on the bottom wall 27, outer face 28, vertical hinge line 16b and hinge panel 16c. The third cigarette wrapping machine folds the cover or rear panel 29 about the outer face 23c of the seven's inner frame 23 and also forms the hinged lid 15. The 5 bottom wall 27 is folded around the combined bottom walls of the seven's inner frame 23b and the bottom wall 22b of the thirteen's inner frame. The outer face 28 is adhesively applied to the outer face 22c of the thirteen's inner frame 22 while the hinge panel 16c, as mentioned, is adhesively applied to the side wall 23d of the seven's inner frame 23. By so constructing and folding the outer frame 26 around the face to face combined packs 75, shown in Figures 11 and 10 12, the pack 10 of the present invention may be hinged about the vertical hinge line 16b allowing the pack to be opened as depicted in Figure 1. It can also be appreciated that the bottom wall 27 of the outer frame must be appropriately cut so that it can separate as seen and depicted. It is further appreciated that any number of cigarettes in the individual bundles 14 and 12 may be utilized so as to create the vertically hinged pack 10 of the present invention.

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In the HLP2 machine 31, the finished cigarette bundle 14 with the wrapped carton of inner framed material therearound is inverted on the conveyor at an inverting station 64, shown in Figure 2, so the that the packs are properly aligned face to face. The conveyor turn 66 is formed to flip the pack appropriately prior to the HLP 3 machine so that the packs 12, 14, when 20 combined as depicted in Figure 11 as combined packs 75, are in face to face relationship on the combined conveyor 69.

The two exit conveyors 65 and 68 representing exit conveyors from the first and second cigarette wrapping machine 30, 31 are placed in side-by-side relationship as they enter into the combination station. As can be understood, one of the conveyors must be displaced vertically

5 from the other conveyor so that as the plungers 70a and 71a are activated to remove the bundles 12, 14 from each of the conveyors 68 and 65, they are in proper vertical alignment so that they may slide over one another to form the combined cigarette pack 75. Plungers 70a, 71a activated by actuators 70, 71, are activated from either side of both conveyors 65, 68 to combine the cigarette bundles in face-to-face relationship for subsequent wrapping by the outer carton blank

10 26. The combined bundles 75 are then passed into HLP3 32 where they are passed onto the individual stations of the blank conveyor 97 containing the outer frame carton 26. The combined bundles 75 are then packaged by the third cigarette wrapping machine 32 as previously mentioned so that the outer frame member 26 provides a vertical hinge line 16b between the two separate bundles 12, 14.

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In the HLP3 machine 32, a number of glue application nozzles are provided in the folding and adhesive stations 91. These glue application nozzles may be HHS spray nozzles for spot gluing on the HLP3 blank conveyor 97. This adhesive is similar to the normal adhesive utilized except that it is more viscous for ready application through the nozzles. Multiple application or

20 nozzles are required in HLP3 machine 32, approximately 6 in all, for spot application of adhesive to the various corners and positions on the outer frame member 26.

In regards to the outer frame member 26, the outer frame is designed to partially surround the two inner frame wrapped foil lined cigarette bundles 14, 12, while also having a score line along the bottom wall 27 thereof which may be cut so that the formed vertically hinged pack 10 5 may open along the necessary hinge line 16b at the side edges. Thus, upon examination of the outer frame blank 26, a small score line may be provided at the vertical hinge line 16b.

The combined bundles 75 are passed into the blank conveyor 97 of the third cigarette wrapping machine 32 (HLP3) as indicated and the adhesive is applied to the appropriate 10 positions, folding operations are conducted so that the tops and sides are folded appropriately surrounding the two bundles 14, 12, while applying adhesive at the appropriate positions. An examination station may also be provided in the HLP3 machine in order to examine each package to ensure that the folding operations and adhesive operations have taken place in the folding and adhesive stations 91 and, where appropriate, reject cartons which are identified and 15 then removed from the HLP3 machine 32.

A transfer conveyor 98 is located at the opposite end of the blank conveyor 97 for moving the formed vertical hinged cigarette package 10 across an adhesive drum for the long side seam adhesive application, along the side panels such as 16c, after which the combined and fully 20 formed hinged lid vertically hinged cigarette package 10 is placed into individual pockets 93, similarly as in HLP1 and HLP2; of the drying drum 92. At the end of the rotational extent or

drying duration of the drying drum 92 and just before the exit aperture 94, a rotary knife or other cutting mechanism 95 may be provided for cutting along the score line or full panel of the bottom wall 27 of the outer frame member 26 or for direct cutting of the full bottom flap. The pack is then forced from the pocket 93 of the drum 92 and moved again to receive another pack. The

5 cutting of the bottom wall 27 is necessary so that the individual cigarette pack 10 may be hinged about the side walls along hinge line 16b and may separate at the now cut bottom wall 27. At the exit 94 of the drying drum 92, the individual packs 10 are removed for later handling and placement into cigarette cartons.

10 In the HLP3 machine 32, all of the folding operations necessary for formation of the outer pack or outer frame is provided. This includes folding of the hinged lid 15 lid and folding the lid over the closed but individually separated cigarette bundles 14, 12.

The HLP1 machine 30 and HLP2 machine 31 are initially designed to run at about 140

15 packs per minute. The foil wrapping system for both HLP1 and HLP2 are standard twin foil reel holders with typical rotary cut off and foil perforation units. The foil lining 16 is perforated as is normally conducted using a straight cut knife or serrated knife so that the upper exposed section on both bundles 14, 12, of the foil may be removed by the user. In relation to the blank folding and adhesive stations 59 provided along the blank conveyor 56 of both HLP1 and HLP2,

20 standard plough folders and top panel reciprocating folders are utilized. Fold tabs 22e may also be placed at the top of the opposing side walls on the outer face 22c of the inner frame 22 in

order to help maintain the hinged lid 15 in closed position. These folding tabs 22e are placed on the inner frame member 22.

The drying drums 61 and 92 utilized in all three machines 30, 31, 32, are forty-eight stage 5 heated drums which are temperature controlled to assure proper drying of the adhesive in the formed packs.

The system of the present invention combines 3 pieces of machinery, a first cigarette bundle making machine 30, a second cigarette bundle making machine 31 and a third combined 10 outer wrapping machine 32. The system of the present invention provides for creation of two inner frame foil wrapped bundles of cigarettes 14, 12, which are combined in a third wrapping machine 32 that provides an outer frame making apparatus. The first cigarette packing machine 30 creates a foil wrap cigarette bundle surrounded by a first inner frame member 23. The second cigarette packing machine 31 creates a second foil wrapped bundle wrapped in a second inner 15 frame 22. The first inner frame 23 and the second inner frame 22 are subsequently combined into a face to face combined pack 75. In the present example, the second inner frame 22 can contain seven cigarettes and six cigarettes combined for a thirteen cigarette bundle pack 14 while the other cigarette packing machine can create a seven cigarette foil wrapped bundle 12 surrounded by the first inner frame member 23. Both inner frames with the foil wrap cigarette 20 bundles are then fed into a outer frame carton folding machine 32 which combines the two bundles into a side hinged pack having a hinged lid.

The three machine cigarette packer of the present invention is controlled by a standard operable controlling device such as a PLC or similar electronic controller mechanism for controlling the transfer speeds and production speeds of all three packers. Such electronic controllers are known in the art and various electronic arrangements and embodiments may be

5 utilized to effectuate control of the individual packers set forth herein.

It is apparent that variations to the different cigarette makers are available while still using concepts of the present invention disclosed herein and claimed. Such variations are deemed to fall within the teachings and claims of the present application.